Equal Weighted Indexing – A Critique of S&P's Study

May 20, 2008

On the fifth anniversary of the introduction of the S&P 500 Equal Weighted Index (EWI), Standard and Poor's released a study documenting its performance. Our review shows the study offers little evidence the EWI offers risk-adjusted returns to investors.

The study was conducted by two researchers at S&P, Srikant Dash and Keith Loggie.

Background

The EWI is an index consisting of the securities in the S&P 500, where each security's holding is 0.2% (1/500th) of the total index. It differs from the traditional S&P 500 index, where each security's holding is proportional to its overall market capitalization.

The EWI was released by S&P on January 8, 2003, and became the first index to offer non-traditional (i.e., other than capitalization-based) weighting and to become widely used. Since then, a number of other non-traditional indexes have been introduced, including fundamentally (RAFI) weighted, dividend weighted, and revenue weighted indexes. Although the EWI originated in 2003, S&P is able to recreate the index through backtesting, and their study examines performance since 1990.

The rationale behind the EWI, according to S&P, is as follows: "Since the index is factor indifferent, it randomizes factor mispricing and is thus an attractive option for proponents of the theory that the market is inefficient, and at times, over or underweight certain factors."

S&P's study shows there are approximately $8.5 billion in assets utilizing its equal weighted methodology. These include approximately $1.4 billion in the RSP ETF, which is an equally weighted version of the S&P 500.

Results of the Study

S&P compares the sector weightings of the EWI and the cap-weighted S&P 500 over time. As would be expected, the EWI sector weighting are relatively stable over time, whereas the cap-weighted sector weightings vary considerably, for example showing a considerable overweighting in information technology during the internet bubble of the late 1990s. It is precisely this effect that proponents of non-traditional weightings cite as evidence for the inefficiency of capitalization

weighted indices. The rationale is that equal-weighting (and other non-traditional weightings) remove the overweighting of sectors during times when they become artificially overpriced. In the case of the EWI, sector weightings change only when stocks come into or out of the index, or if the sector classification of an existing security is changed. This leads to relatively stable sector weightings over time.

One of the primary concerns with the EWI is that it will lead to excessive turnover. To maintain equal weightings, the index needs to be rebalanced daily, to respond to daily price changes in the index constituents. S&P compromises on this requirement, and rebalances quarterly, thereby introducing a tracking error. The study cites quarterly rebalancing results in annual turnover of 22.09%, approximately five times the 4.01% of the turnover of the SPY. However, S&P claims the EWI turnover is reasonable when compared to that of the Mid Cap 400 (13.65%) and Small Cap 600 (13.93%). S&P also claims the EWI turnover is reasonable when compared to other non-traditionally weighted indices with turnovers that range from 15% to 30%.

Because of the daily rebalancing requirement, the EWI is not a passive index, and cannot be used as a benchmark representing a buy-and-hold strategy. With a capitalization-weighted index, it is theoretically possible for the whole market to own the index. This is not possible with the EWI, because of liquidity issues with the lower capitalization constituents.

Liquidity is the second concern with the EWI. In theory, as assets tied to the EWI grow, liquidity pressure will be felt by the smallest stocks in the index, in order to maintain their 0.2% weighting. S&P maintains that, based on assets tied to capitalization-weighted S&P indices, EWI assets would need to grow ten fold before liquidity concerns would surface.

The most significant results of the study relate to the performance of the EWI. Specifically, S&P claims the following:

- The EWI outperformed the S&P 500 by 1.5% annually since 1990, although performance relative to the S&P 500 varied considerably over time.

- “Although the historical data for the S&P 500 EWI comprises only one major bull market and correction, the performance of the index over this time suggests that equal weighting may underperform relative to market cap weighting during strong markets but will correspondingly hold up better during bear markets.”

- The volatility of the EWI has been equal to or greater than the volatility of the S&P 500, based on rolling three year standard deviations. S&P does not provide a summary statistic for the average volatility difference since 1990.

- The correlation between the two indices has generally been between 94% and 96%, with the exception of the internet bubble period, when the correlation reached a low of 84%.

- As would be expected, the EWI returns fall between those of large cap and mid cap stocks. Its returns vary between being influenced by growth and value, but in the majority of periods it is on the value side of the chart. This leads S&P to conclude that "equal weighting results in unique exposure to a complex and dynamic combination of size and style risk factors. It may be difficult to replicate S&P 500 EWI return outcomes through a simple combination of style and sector indices."

S&P also looks at a performance of an equal weighted index of international stocks. They created and backtested an equal weighted version of the S&P International 700, the non-US equivalent of the S&P 500. The index delivered higher performance as compared to its cap-weighted counterpart, but with higher volatility and a relatively high (> .90) correlation to the cap-weighted benchmark.

Our Analysis

For advisors, the key question is whether the EWI offers risk-adjusted performance benefits. The S&P study fails to answer this question. To answer this question, returns from the EWI would need to be regressed against an appropriate benchmark, and the alpha and beta would be evident. Fama and French showed (in 1993) that small cap and value portfolios have higher performance than the market in general. S&P states that the EWI exhibits a small cap and value bias, yet their study makes no attempt to quantify whether this bias explains the outperformance of the EWI, with respect to the S&P 500. In fact, another study showed precisely this effect. The EWI outperforms the capitalization weighted S&P 500 at the times when small cap and value stocks do better than large cap and growth stocks, and vice versa.

We also question whether the S&P 500 is the appropriate benchmark for performance measurement. According to FundGrades, the RSP ETF has higher correlations (measured over the last three years) to three other indexes, as compared to a Large Cap Blend index such as the S&P 500:

Index	Correlation
Total Domestic Equity	0.967
Mid Cap Value	0.958
Mid Cap Blend	0.948
Large Cap Blend	0.944

A more rigorous and meaningful analysis would have included performance measurement against those benchmarks that exhibit the highest correlation.

The S&P study does not provide any data on the extent of the tracking error introduced by quarterly rebalancing of the EWI. Morningstar shows that the top 5 holdings in the RSP range between 0.26% and 0.35%, greater than the 0.20% target, so we know this tracking error exists.

The S&P study claims the turnover of the EWI is low, relative to the turnover of passive capitalization weighted indexes. Turnover will manifest itself in the expense ratios of ETFs, and the expense ratio on RSP is 0.40%, where as the expense ratio on SPY, a capitalization-weighted S&P 500 index, is 0.08%. The expense ratio on EMM, a Mid Cap ETF is 0.25%. S&P claims it may be difficult to replicate the EWI by combining other indices, yet they offer little evidence to support this claim. Given the crucial role turnover and expenses can play in a passive strategy, advisors need to know whether EWI returns can be replicated at a lower cost.

We spoke with Ron Surz, whose firm, PPCA, provides performance attribution analysis to wealth managers. Surz notes that the S&P study "wants to be objective, properly acknowledging that performance differentials between equal and cap-weighting will be driven by sector and style differentials, but S&P can't resist claiming equal weighting 'works' both domestically and abroad. I assume 'works' means equal outperforms cap-weight, even adjusted for risk." Surz agrees the appropriate test for outperformance would be a regression using the Fama-French model and, in the absence of such an analysis, finds it "hard to swallow" that the EWI offers risk-adjusted value.

Surz also notes the holdings-based style profile of the EWI, like the returns-based sector profile, should show a pretty level allocation across styles through time. But the returns-based shows dramatic style shifts. This demonstrates the differences between holdings-based and returns-based style analysis. Holdings-

based analysis is all about composition – how you categorize the stocks in a portfolio. Returns-based is about behavior – what style blend behaves most like the portfolio. You would expect the two approaches would agree, and they do much of the time, but obviously not when you equal weight.

S&P claims "equal weighting is factor indifferent. It randomizes factor mispricing and is thus an attractive option for proponents of the theory that the market is inefficient and at times, mis-prices factors." We disagree, and find no evidence in this study that the EWI offers the ability for investors to capitalize on market inefficiencies, on a risk-adjusted basis.

Finally, we stress that we offer no opinion as to whether EWI is a good or bad investment. S&P's study should have answered this question, but it does not.